Economics, Law and Ethics
Part IB CST 75%, Part II CST 50%
2021-22

Alice Hutchings, Richard Clayton

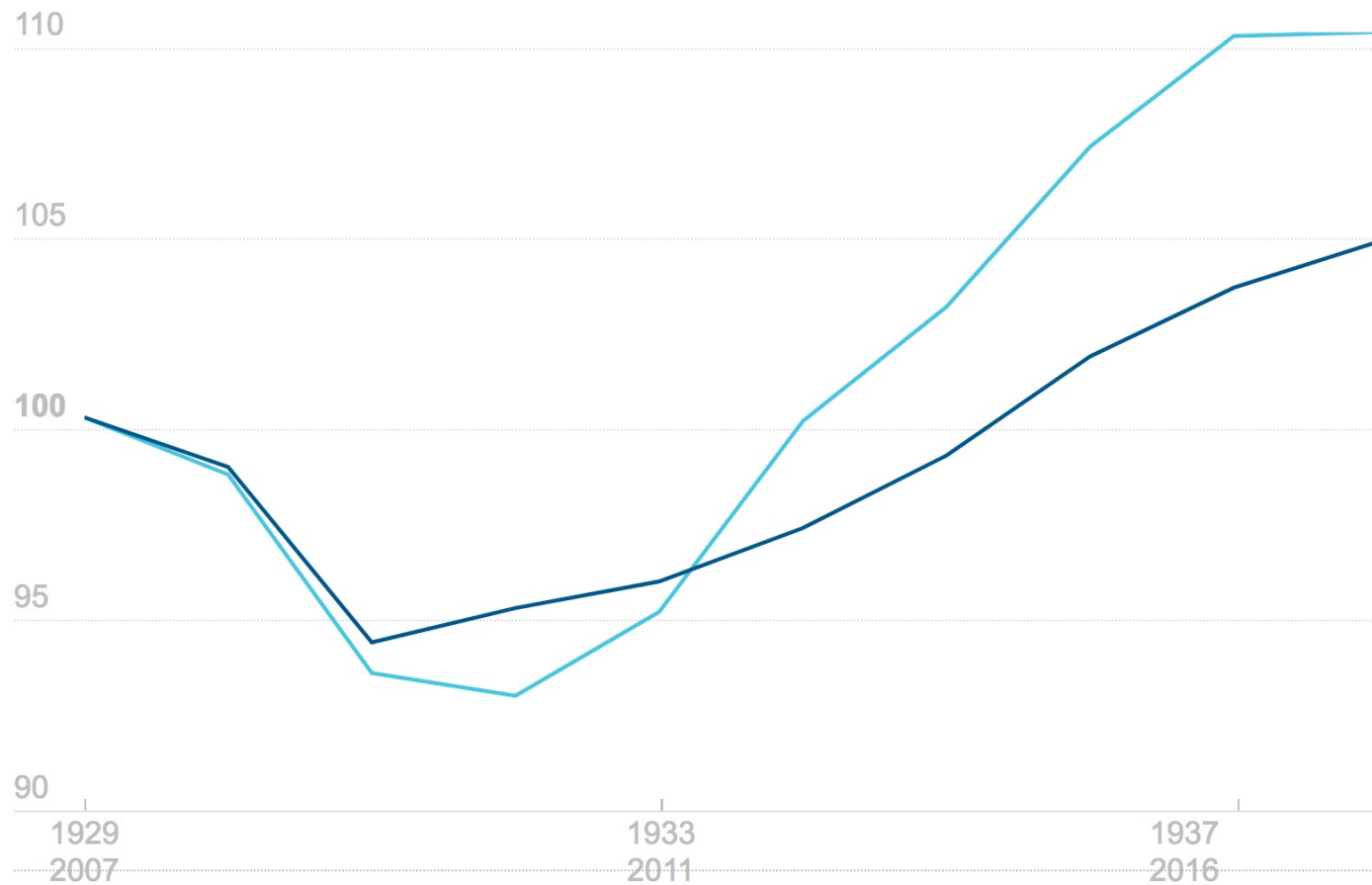*with many thanks to Ross Anderson*

Overview

- ## Market failure:
  - The business cycle
  - Recession and technology
  - Trade
  - Public and club goods
  - Information Asymmetry

- ## Behavioural economics:
  - Bounded rationality
  - Cultural biases
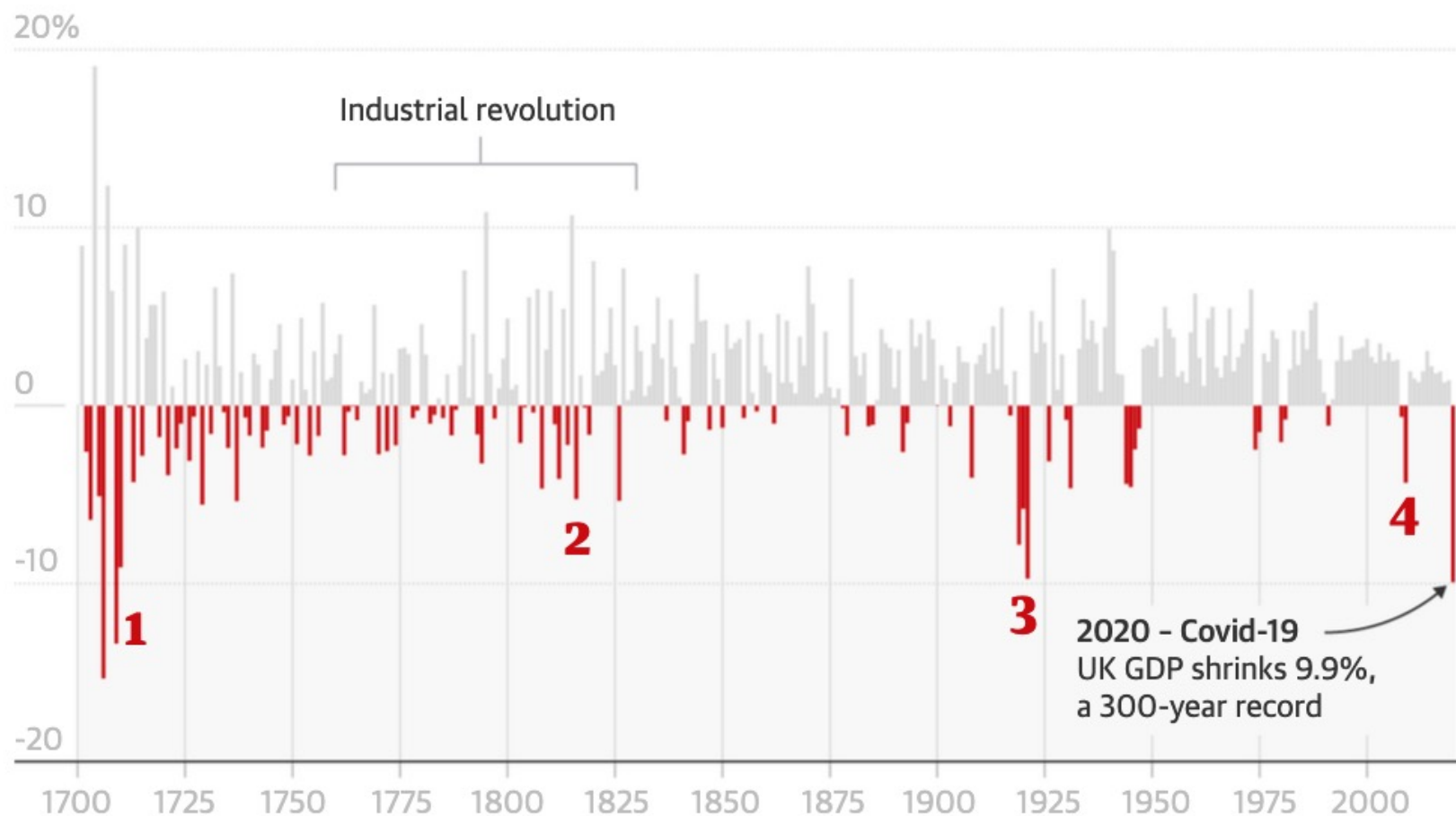 - Nudge theory
  - Agency effects

The Business Cycle

GDP per 20- to 64-year-old. Index, 100 = level in pre-recession year

● 1929-1938   ● 2007-2016

Guardian graphic | Source: House of Commons Library, Bank of England, Central Statistics Office, ONS

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Chart: UK GDP annual growth, 1700–2020

Y-axis: 20%, 10, 0, -10, -20

X-axis: 1700, 1725, 1750, 1775, 1800, 1825, 1850, 1875, 1900, 1925, 1950, 1975, 2000

Industrial revolution

1

2

3

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2020 – Covid-19
UK GDP shrinks 9.9%,
a 300-year record

1 1709: The Great Frost
The economy is dragged down as frozen rivers, canals and seaports disrupt trade across Europe

2 1815: The end of the Napoleonic wars at the battle of Waterloo is followed by economic depression. Poor harvests and the Corn Laws push up food prices and clamour for political reform leads to the Peterloo massacre in 1819, and foundation of the Manchester Guardian two years later

3 Post WW1 slump
The biggest downturn of the past two centuries comes after WW1 and the Spanish flu pandemic, which kills more people than the conflict. Growth returns in 1922 but aftershocks lead to the 1926 general strike, which causes another recession

4 Financial crisis
The collapse that follows the banking crisis is the worst since WW2. It begins in 2007–08 and a decade of anaemic recovery, made worse by austerity, follows

Guardian graphic. Source: Bank of England, ONS

The business cycle (2)

- The business cycle was a puzzle for classical economists. Why the pattern of boom and bust?
- Say's law: supply and demand are equal
- Mill and Ricardo argued that demand for goods + savings = supply of goods + investment, and savings = investment, so demand = supply
- 1930s: Keynes' more sophisticated model of 'liquidity preference'. People want a certain level of savings – maybe 3 months' salary. In a recession, liquidity preference rises
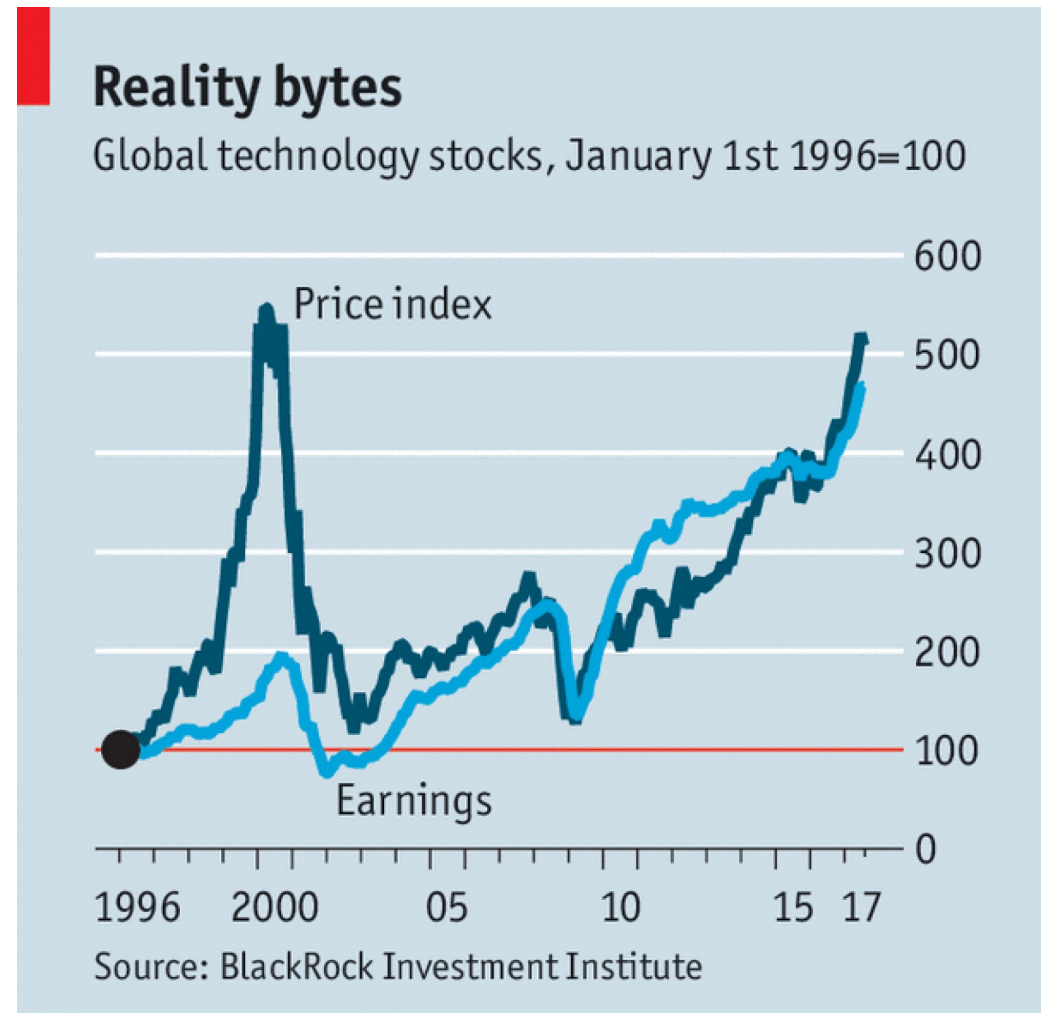- Many other dynamic effects, different timescales…

The business cycle (3)

- Credit actually introduces instability
- In a boom, people and firms borrow assets that appreciate faster than the interest they pay
- A bank that takes in £100 in deposits might lend out £94; so £6 of capital underwrites £94 of lending – a multiplier of 94/6 = 15.7
- In a recession many things happen at once:
  - Some loans go bad, eating into capital
  - The bank's share price falls, further eating capital
  - The regulator raises capital requirements from 6% to 8%
  - The government competes for the available loans
- So the money supply could contract sharply
- This time round, governments fixed that (quantitative easing)

Recession and tech

- Great Recession kicked off by US mortgage crisis of 2007 which led to collapse of money markets
- Recessions may be fed by bubbles bursting but are often tied up with technology change
- Railways 1840s, electricity 1880s, cars 1920s, tech now – boom creates capacity, bust slashes prices
- We've killed whole industries (telephone switchgear), taken over others (bookselling), marginalized others (local newspapers, music publishers) and are disrupting most of the rest
- Schumpeter: 'creative destruction'

Recession and tech (2)

Reality bytes

Global technology stocks, January 1st 1996=100

Price index

Earnings

1996 2000 05 10 15 17

Source: BlackRock Investment Institute

Economist.com

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Trade

- Adam Smith "Wealth of Nations" (1776):

    'If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it off them with some part of the produce of our own industry, employed in a way in which we have some advantage'

- Ricardo, 1817: it's comparative advantage that matters

Trade (2)

- Ricardo considered the following costs:

	wheat	wine
England	15	30
Portugal	10	15

- Portugal has an absolute advantage at producing both
- But England has a comparative advantage in wheat – each unit costs 1/2 unit of wine versus Portugal's cost of 2/3 a unit of wine

Trade (3)

- Suppose England has 270 units of labour, Portugal 180

	wheat	wine
E	8	5
P	9	6
Total	17	11

	wheat	wine
E	18	0
P	0	12
Total	18	12

- Mill: welfare gains from trade come from cheap imports
- Heckscher-Olin model: capital v labour (outsourcing)
- Under perfect competition, free trade optimal; almost all economists agree it's also a pragmatic optimum; but there can still be losers. English vintners?

Growth

- Adam Smith: output = f(land, labour, capital); so growth means land improvement / colonisation, education / specialisation, capital accumulation
- Keynes: it's all about capital formation
- Neoclassical school (Solow, Swann…): it's all about technology and population growth
- Modern view (Becker, Romer): mostly know-how
- Chad Jones: US growth 1950–93 due 50% to worldwide R&D, 30% better education, 20% to population growth in idea-producing countries
- Prescription: spend four times as much on R&D!

Tragedy of the commons

- 100 peasants each graze a sheep on the common
- If one peasant adds one more, he gets 100% more, while the others get 1% less
- Overgrazing, overfishing …
- Welfare theorems assume complete property rights, atomistic principals and full information
- Where this fails, private cost ≠ social cost
- Observed forever, documented by 1830s, used to justify enclosure movement, inspired Malthus

Externalities

- Externalities are goods / bads people care about, but not traded: typically side-effects
- Consumption externalities include smoking in restaurants, domestic heating emitting CO_2
- Production externalities include a steelworks polluting a fishery downstream, or emitting CO_2
- Positive externalities include education (1 more year = 2% crime reduction), file formats,…
- In the presence of externalities, competitive equilibria are unlikely to be Pareto efficient
- Can in theory fix with property rights (Coase) but this is hard with many players, or delays

Public goods

- A public good is non-rivalrous and non-excludable
- Example: scientific knowledge. The producer can appropriate a small part of the benefit (e.g. PhD thesis); the rest spills over to all
- Example of a public bad: CO_2 emissions. Again, everyone gets to 'consume' the same amount
- Strong temptation for people to free-ride!
- If production is decided communally, there are potential 'impossibility theorem' issues
- Alternatives? Prizes / taxes? Cap-and-trade? …

Club goods

- Traditional communities can simply limit scale
- E.g. fishermen in Turkey: 40 fishermen gather in tea-house, arrange rota, signed by mayor
- Self-enforcing: if you find another boat in a good spot when it's your turn, chase them
- Elinor Ostrum studied many examples to work out the conditions under which this is sustainable
- Internet routing used to work this way!
- But what happens when the club breaks down?

Enter politics …

- Buchanan: 'Politics is a structure of complex exchange among individuals, a structure within which persons seek to secure collectively their own privately defined objectives that cannot be efficiently secured through simple market exchanges.'
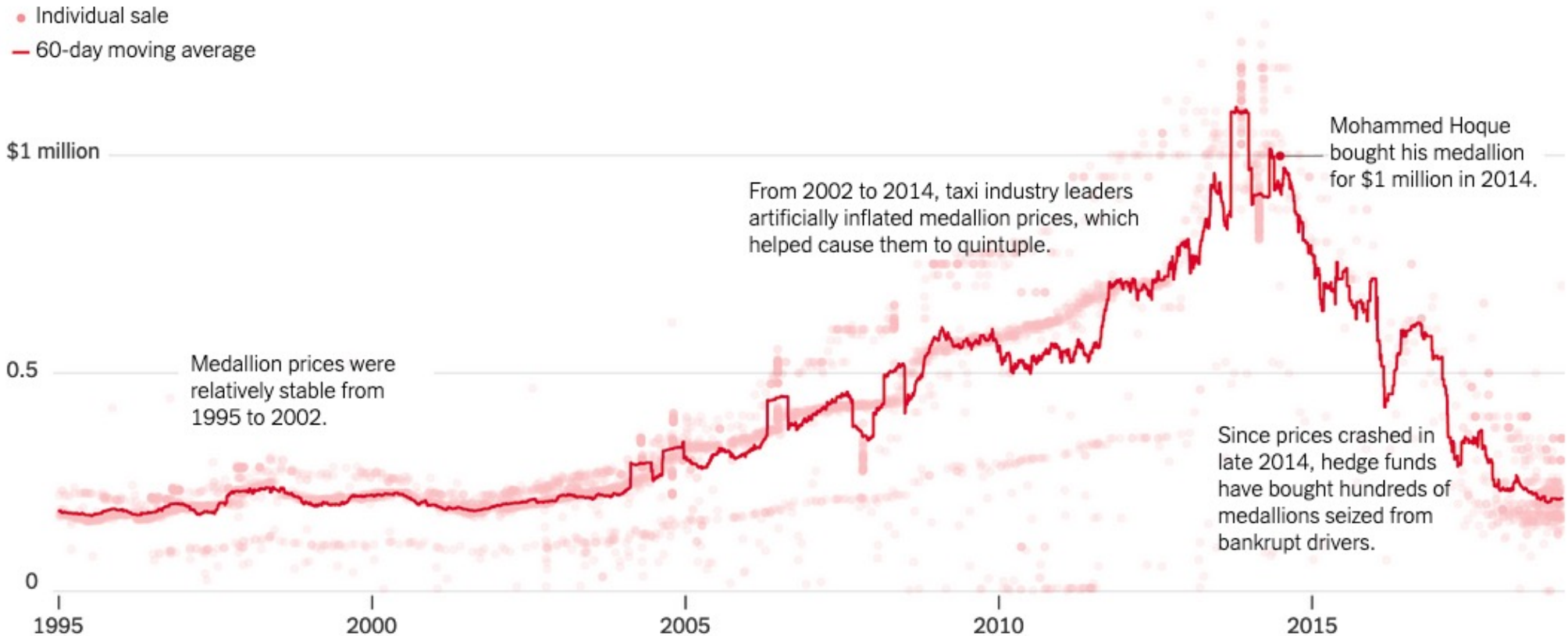- But politics has costs too!

Monopoly rents

- Absent barriers to entry, firms will enter a market until excess profits competed away
- Economists define a rent as an excess, undeserved income resulting from barriers to competition
- 'Rent-seeking' drives much of politics

Monopoly rents

- What if we regulate prices?
  - In 1986, New York taxi licenses cost $100,000 yet drivers earned $8 an hour
  - License owner makes $17k p.a. net – 17% ROI
  - Politicians put up fares, supposedly to help drivers
  - Extra $10,000 p.a. just added $60K to the value of a license, so helped the owners instead!

Monopoly rents

How the Price of a New York City Taxi Medallion Has Changed

- Individual sale
- 60-day moving average

$1 million

Mohammed Hoque bought his medallion for $1 million in 2014.

From 2002 to 2014, taxi industry leaders artificially inflated medallion prices, which helped cause them to quintuple.

0.5

Medallion prices were relatively stable from 1995 to 2002.

Since prices crashed in late 2014, hedge funds have bought hundreds of medallions seized from bankrupt drivers.

0

1995   2000   2005   2010   2015

By Scott Reinhard | Source: New York City Taxi and Limousine Commission

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https://www.nytimes.com/2019/05/19/nyregion/nyc-taxis-medallions-suicides.html

Asymmetric information

- Akerlof won the Nobel for the 'market for lemons'
  - 100 used cars for sale – 50 good cars worth $2000, 50 lemons worth $1000
  - Buyers can't tell difference – so price $1000
- One fix is for sellers to offer a warranty – this is cheaper for owners of good cars, so can act as a 'signal' for the hidden information
- Why is a Cambridge degree valuable? It's hard for employers to tell smart diligent employees from interview, so many use education as a signal
- Signaling theory is important for recommender systems – Google, eBay, Grameen

Asymmetric information (2)

- Do Volvo drivers have more accidents because:
  - Bad drivers buy a Volvo to survive accidents better
  - Volvo drivers compensate for safety by driving faster?
- The first effect is 'adverse selection' and the second 'moral hazard': examples of 'hidden information' versus 'hidden action'
- Lemons market: adverse selection
- Insurance markets can also be trashed by moral hazard; hence excess, no-claims bonus, …
- Moral hazard can also lead to surveillance, such as insurance company black boxes monitoring drivers

Behavioural economics

- Classical economics: Assumption that individuals are rational: they maximise utility with no cognitive limitations

- Behavioural economics: Experimental psychology indicates behaviours deviate from the rational choice model

Bounded rationality

Value

Loss　　　　　Gain
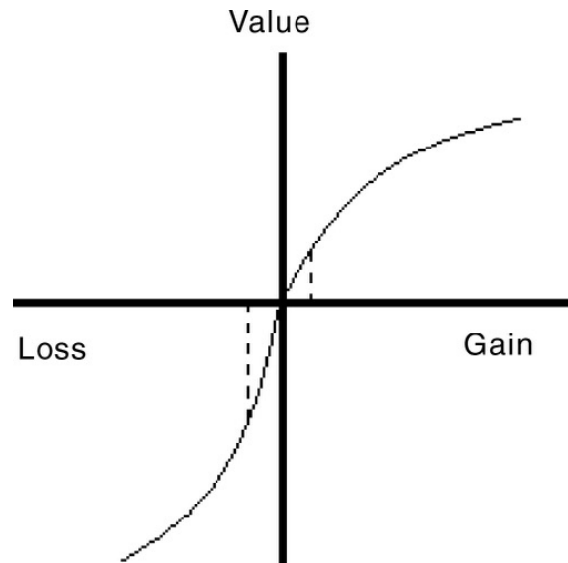
- Recall Prospect Theory from 1a SSE: people offered £10 or a 50% chance of £20 usually prefer the former; if offered a loss of £10 or a 50% chance of a loss of £20 they usually prefer the latter!

- And recall the Asian disease problem – framing actions as 'saving' can make them more attractive

- The misperception of risk is a big deal: it's how terrorism works (and a lot of other political marketing)

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Bounded rationality (2)

- Herb Simon coined 'bounded rationality' in the 1950s along with 'satisfice'
- People try to make just-good-enough decisions
- A satisficer will work hard until his lifestyle goals are met, then slack off.
- Most of us are satisficers, and VCs don't like this!
- Another common rationality bound is 'hyperbolic discounting': people disregard far-future events (most people have inadequate pensions)
- The endowment effect: people generally demand a higher price for something they already own

Cultural biases

- Some biases we acquired from evolution are modulated by culture
- Calıskan noted that machine translation from gender-neutral Turkish text gave male doctors, but female nurses
- She ran experiments and found all MT systems were sexist, racist, homophobic ... inhaling prejudice with their training data
- See paper, linked from web page

Nudge theory

- Application of behavioural economics to policy

- The way choices are presented to people can have a powerful impact

- Changes to context can induce individuals to make better choices.

- Does not address underlying structural problems.

The power of defaults

- Most people just go with the flow. So:
- Marketing: firms make people opt out of getting spam / buying extra insurance …
- Libertarian paternalism: governments make people opt out of some policy options, from pensions (US, UK) to organ donation (Spain) to use of medical records in research (most countries)
- Recall from SSE: why do people worry too much about terrorism, but not enough about IT security?

What nudges have you come across that were designed to shape the behaviour of yourself or others?

Agency effects

- Classical economics sees institutions as rational
- But decisions are made by individual managers, who optimise their own utility too
- 'New institutional economics': study managers' behaviour. Should you give them stock options to align their interests with shareholders?
- 'Public-choice economics': apply this incentive analysis to civil servants and elected politicians ("Yes, Minister"). What's the cost of democracy?
- Why do public-sector IT projects fail more often?